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Drawing Book 8, chapter 6: Subgrade, Concrete wall and column details

Include work order no. and floor no. if applicable

Roll # DB03	**Doc. ID (report #, dwg. #):**	
Document Date: 1968-70	**Document Author Name:**	**Author Organization:** SHC&R

KEYWORDS – HIGHLIGHT ALL THAT APPLY

Level 1

Bankers Trust	Project 4	WTC 1 - North Tower	Add
Below Grade	Project 5	WTC 2 - South Tower	
Concourse	Project 6	WTC 3 - Marriot Hotel	
Electrical Substation	Project 7	WTC 4 - South Plaza Bldg.	
Liberty Plaza	Project 8	WTC 5 - North Plaza Bldg	
PATH Station	WFC 1 - Oppenhiemer Dow	WTC 6 - Customs House	
PATH Terminal	WFC 2 - Tower B	WTC 7	
Project 1	WFC 3 - American Express	WTC Complex	
Project 2	WFC 4 - Tower D	WTC Plaza	
Project 3			

Level 2

Accident analysis & risk	Fire protection	Misc. Performance Problems	Structural
Architectural	Fire service	News coverage	Tenant alterations
Data request	Landscaping	Police	Tenant Space
Emergency management	Management	Security	Add
Evacuation	Mech./elec.		

Level 3

1993 explosion	Cranes	Frame	Roof	Weight
A/E fitout	Criteria	Frame analysis	Safety	Weld detail
A-242	Dampers	Frequency	Schedule	Weld size
A-36	Debris	Fuel	Sculpture	Welding
A-497	Deck	Furniture layout	Security system	Wind
Aircraft impact	Deflection	Generators	Shear knuckle	Windows
Air cooled condensers	Demolition	Guidelines	Shear test	Yield strength
Analysis	Design	Gypsum board	Shear Stud	Add
Angles	Detailing	Hat truss	Shop drawings	Drawing books
Antenna	Doors	Human comfort	Shortening	
Artifacts	Drawings	HVAC	Slab	
Asbestos	Eastern States Steel	Index	Slurry wall	
Base plate	Egress	Inspection	Smoke control	
Beams	Elevator	Insulation	Smoke test	
Bid documents	Elevator Shaft	Job number	Spandrel beam	
Bid Invitation	Emergency communications	Joist	Specifications	
Bow tie	Equipment	L-50	Splices	
Bracing	Erection marks	Lighting	Sprinkler	
Bridging truss	Errors & Omissions	Loads	Stability	
Building code	Escalator	Maintenance	Stairways	
Calculations	Expansion joint	Marking	Standards	
Carpet	Exterior columns	Mesh reinforcement	Steel	
Ceilings	Fabrication	Mill inspection	Steel composition	
Certification	Family member	Model	Stiffness	
Chillers	Field survey	Mullion	Structural review	
Cladding	Fire alarms	Operations	Surveillance	
Collapse	Fireproofing	Paint	Survey	
Columns	Fire spread	Partition layout	Survivor	
Communication systems	Fire testing	Partitions	Tenant list	
Composite truss	Firetower	Photos	Tenant occupancy	
Computer output	Flag Pole	Pipes	Testing	
Computer program	Flammability	Plumbing	Tie	
Concrete	Floor	Prestressing	Tolerances	
Connections	Floor load	Probability, uncertainty	Transfer Girders	
Construction	Floor slab	Quality control	Triad	
Contract	Floor system	Ramp	Truss	
Core beams	Floor trusses	Reinforcing (strengthening)	Vestibule	
Core columns	Formwork	Renovation	Vibration	
Corrosion	Foundations	Repair	Walls	
Cracking	Fracture	Research & Development	Water supply	
			Weather	

WTCI-1066-LERA

SKILLING, HELLE, CHRISTIANSEN, ROBERTSON Structural & Civil Engineers

PROJECT	TITLE	DATE
THE WORLD TRADE CENTER	CONCRETE TYPICAL DETAILS - INDEX	9/ 1/70

REVISIONS

7-9-68
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12-18-68
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9-1-70

8-JK6- 1	INDEX
8-JK6- 2.1	WALL DETAILS
8-JK6- 2.2	WALL DETAILS
8-JK6- 2.3	WALL DETAILS
8-JK6- 3	WALL FOOTINGS
8-JK6- 4	VOID
8-JK6- 5	ENCASEMENT OF CONDUIT
8-JK6- 6	C.I.P. WALL OVER TOP OF SLURRY WALL
8-JK6- 7	STEEL BEAM OVER C.I.P. PERIMETER WALL
8-JK6- 8	TOP OF SLURRY WALL ALONG WEST STREET
8-JK6- 9	CONCRETE COLUMN TYPES
8-JK6- 10.1	CONCRETE COLUMN SCHEDULE
8-JK6- 10.2	CONCRETE COLUMN SCHEDULE
8-JK6- 10.3	CONCRETE COLUMN SCHEDULE
8-JK6- 10.4	CONCRETE COLUMN SCHEDULE
8-JK6- 10.5	CONCRETE COLUMN SCHEDULE
8-JK6- 10.6	CONCRETE COLUMN SCHEDULE
8-JK6- 10.7	CONCRETE COLUMN SCHEDULE
8-JK6- 10.8	CONCRETE COLUMN SCHEDULE
8-JK6- 11.1	ENCASEMENT OF STEEL COLUMNS
8-JK6- 11.2	WALL AT STEEL COLUMNS
8-JK6- 11.3	WALL AT STEEL COLUMNS

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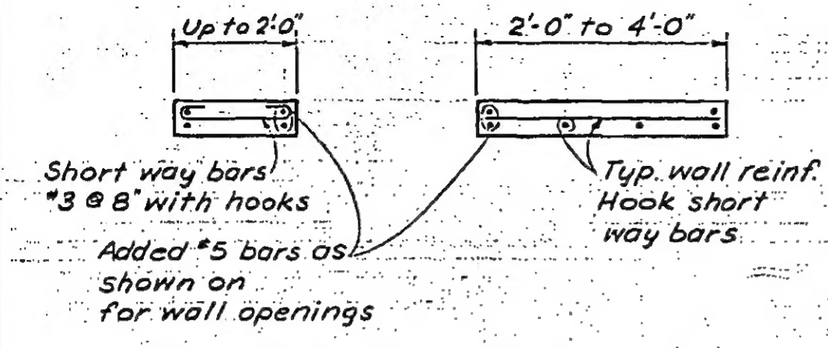
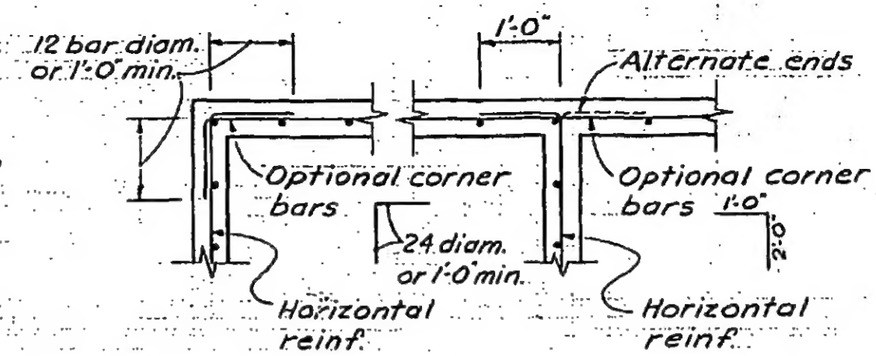
PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL CONCRETE WALL DETAILS | DATE 5-1-68

REVISIONS



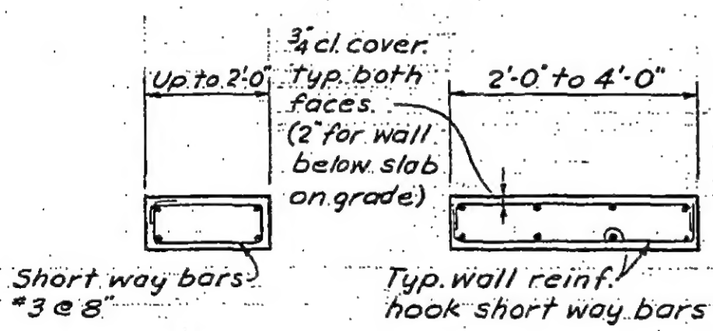
NOTE: Details apply in both horiz. & vert. directions

SMALL WALL SECTIONS



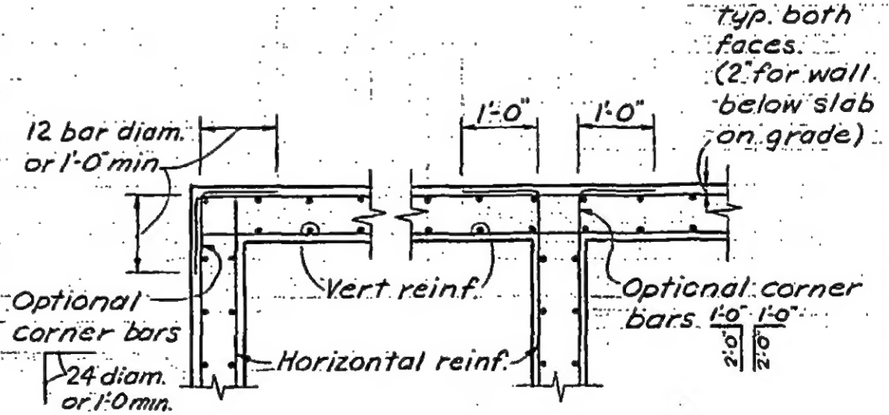
CORNER DETAILS

SINGLE CURTAIN REINFORCEMENT



NOTE: Details apply in both horiz. & vert. directions

SMALL WALL SECTIONS



CORNER DETAILS

DOUBLE CURTAIN REINFORCEMENT

NOTE: Where spliced, the horizontal bars shall lap 27 diam. or 1'-6" min.

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8-JK6-2.1

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PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL CONCRETE WALL DETAILS | DATE 5-1-68

REVISIONS
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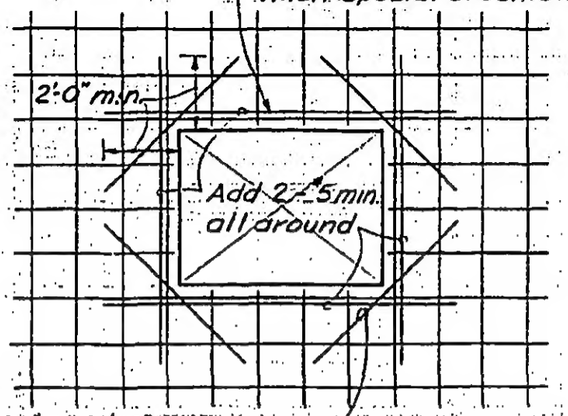
* MINIMUM WALL REINFORCEMENTS

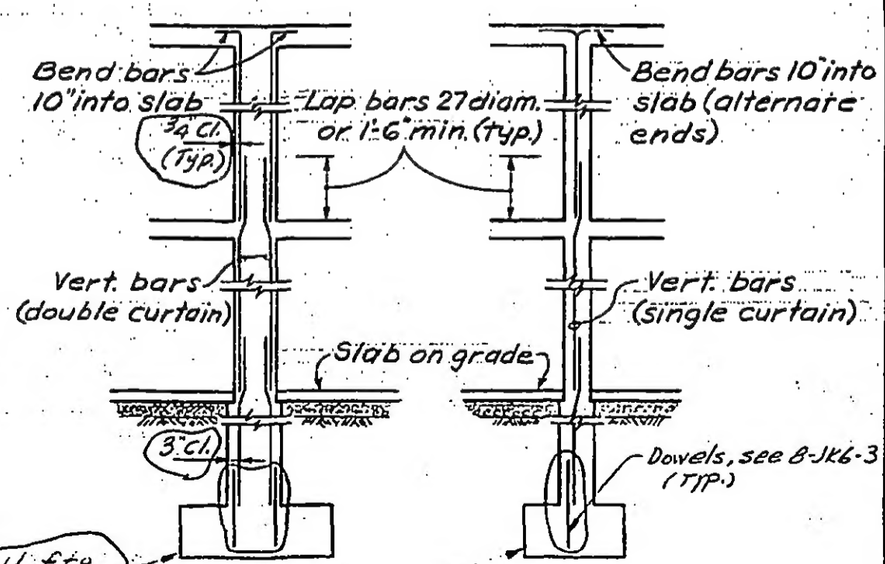
WALL THICKNESS	VERTICAL BARS	HORIZONTAL BARS		LOCATION IN WALL
		WALLS BELOW SLAB ON GRADE	WALLS ABOVE SLAB ON GRADE	
4"	#3 @ 18"	#3 @ 11"	#3 @ 8"	Center
5"	#3 @ 15"	#4 @ 16"	#4 @ 11"	Center
6"	#4 @ 18"	#4 @ 13"	#5 @ 15"	Center
7"	#4 @ 17"	#4 @ 11"	#5 @ 13"	Center
8"	#4 @ 16"	#5 @ 15"	#5 @ 11"	Center
9"	#4 @ 14"	#5 @ 14"	#5 @ 10"	Center
10"	#4 @ 18"	#4 @ 16"	#4 @ 11"	Each face
11"	#4 @ 18"	#4 @ 14"	#4 @ 10"	Each face
12"	#4 @ 18"	#4 @ 13"	#5 @ 15"	Each face
13"	#4 @ 18"	#4 @ 12"	#5 @ 13"	Each face
14"	#4 @ 18"	#4 @ 11"	#5 @ 12"	Each face
15"	#4@17"	#5@16"	#6@16"	Each face
18"	#4@14"	#5@14"	#6@14"	Each face
20"	#4@13"	#5@12"	#6@12"	Each face
27"	#5@15"	#6@13"	#7@12"	Each face
30"	#5@14"	#6@16"	#8@15"	Each face
36"	#6@16"	#7@13"	#8@12"	Each face

* Unless otherwise shown on plans or details.

Note:
All reinforcement shall conform to ASTM A-432 with f_y = 60 ksi unless otherwise shown on sections or details.



* ADDITIONAL STEEL AT WALL OPENINGS



TYPICAL VERT. BAR SPLICES

DRAWN S.C.
REVIEWED J.M. & E.L.

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8-JK6-2.2

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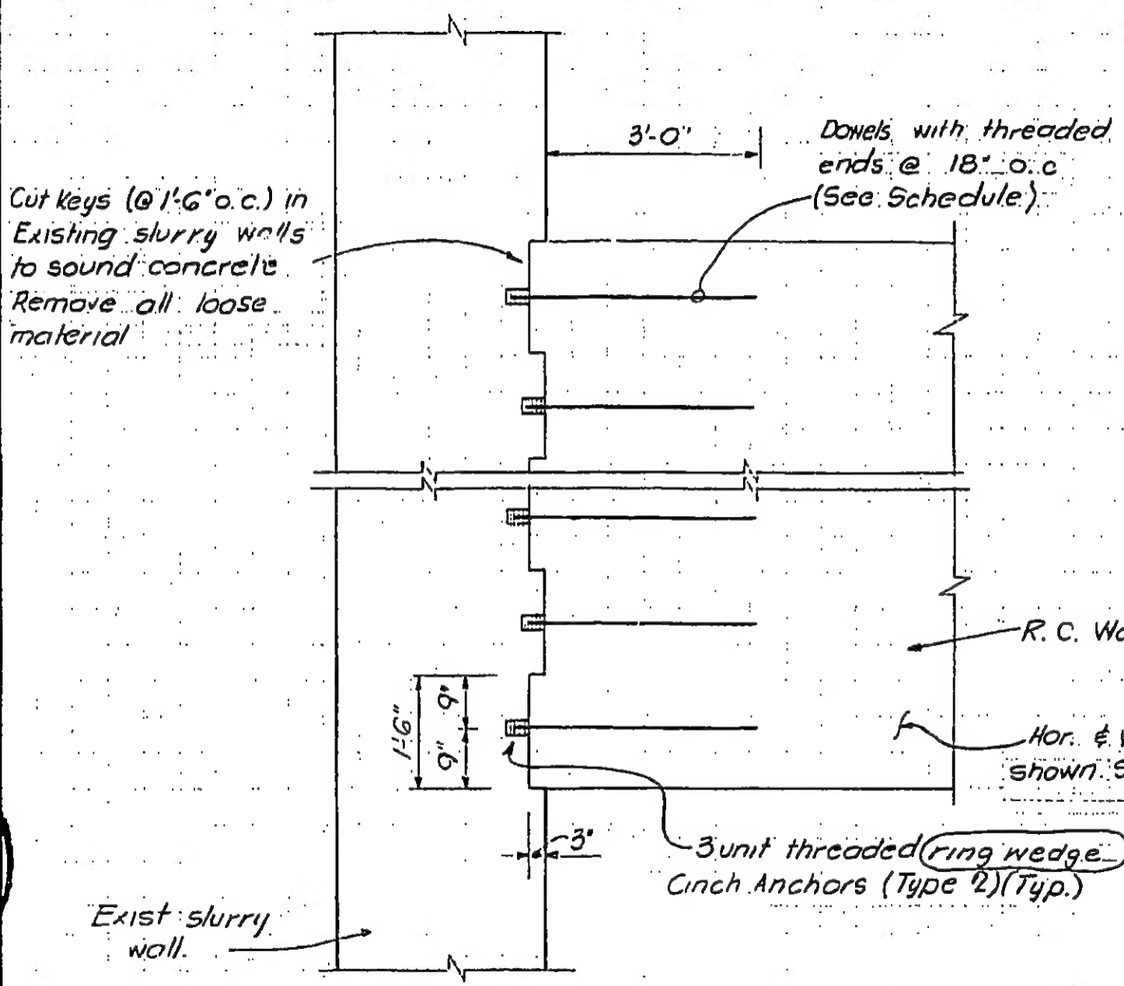
PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL CONCRETE WALL DETAILS | DATE 5-1-68

REVISIONS
12-18-68
3-25-69



* SCHEDULE OF DOWELS

Wall thickness	Size of dowels.	Location in wall
8"	3/4" ϕ	Center
10"	3/4" ϕ	Center
12"	7/8" ϕ	Center
14"	7/8" ϕ	Center
Over 18"	7/8" ϕ	Ea. face

* Unless otherwise noted on details.

TYPICAL DETAIL OF WALL FRAMING TO SLURRY WALL

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PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL WALL FOOTING-DETAILS | DATE 5-1-68

REVISIONS
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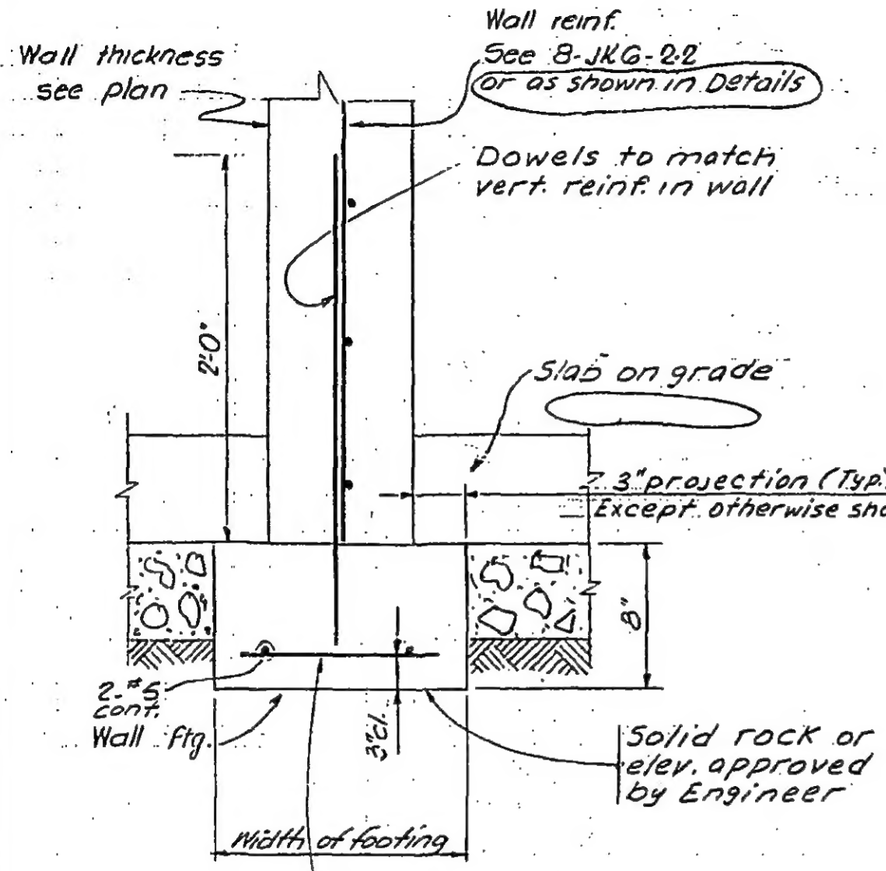
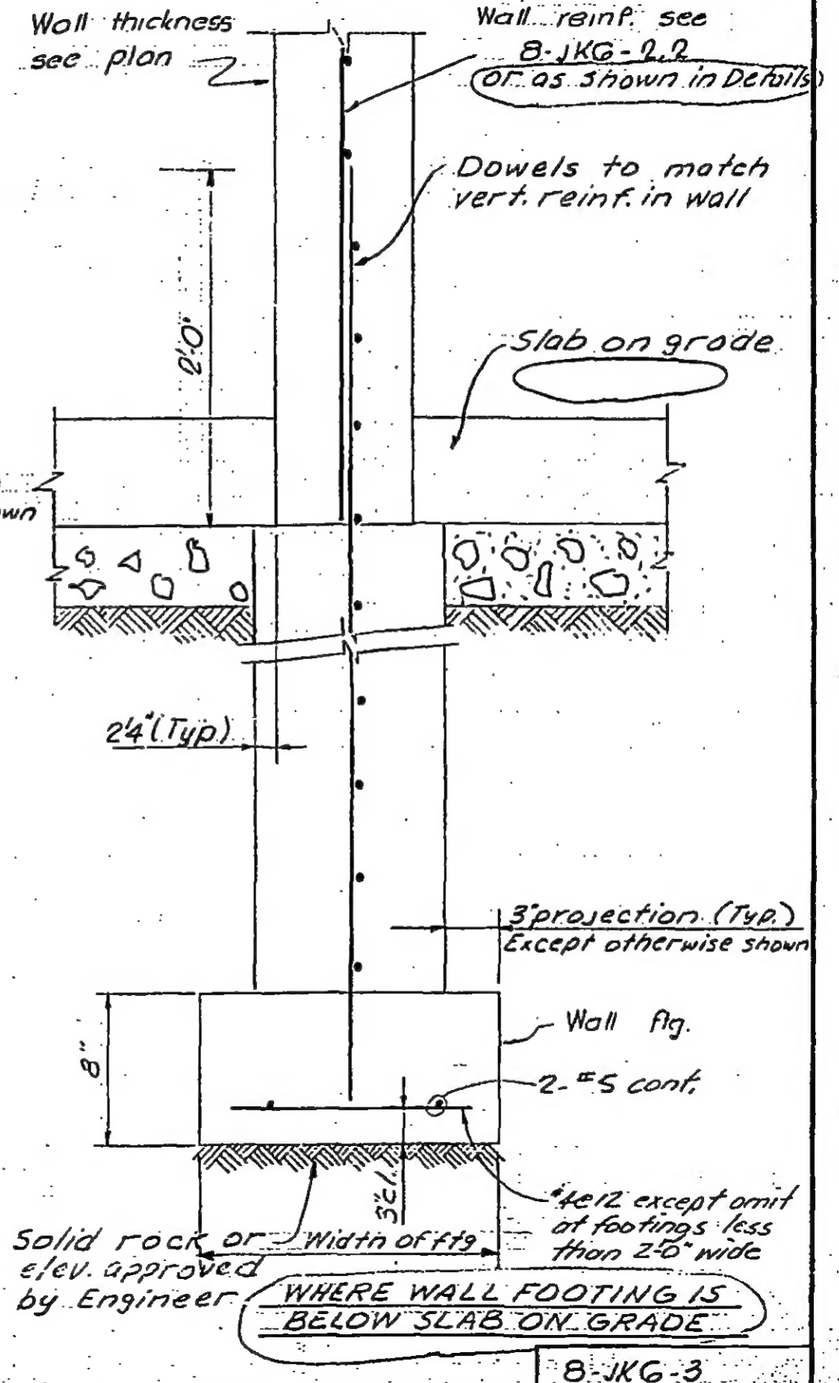
12-18-68
5-5-69



WHERE WALL FOOTING IS DIRECTLY UNDER SLAB ON GRADE

Notes:

1. For walls ≥ 10" use double curtain reinf. ¾" clr. from face of wall above grade and 3" cl. for walls below grade.
2. These details apply unless otherwise noted on plans and sections.



WHERE WALL FOOTING IS BELOW SLAB ON GRADE

8-JKG-3

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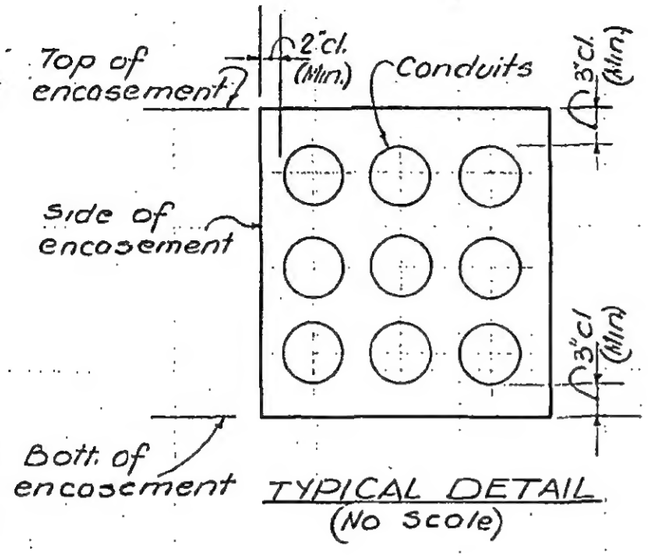
PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL CONDUIT ENCASEMENT DETAIL | DATE 5-1-68

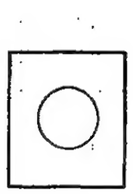
REVISIONS

10-24-69 GEN. REV.

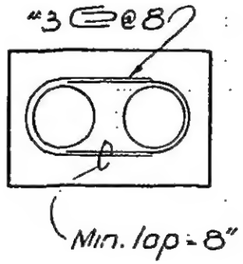


TYPICAL DETAIL
(No Scale)

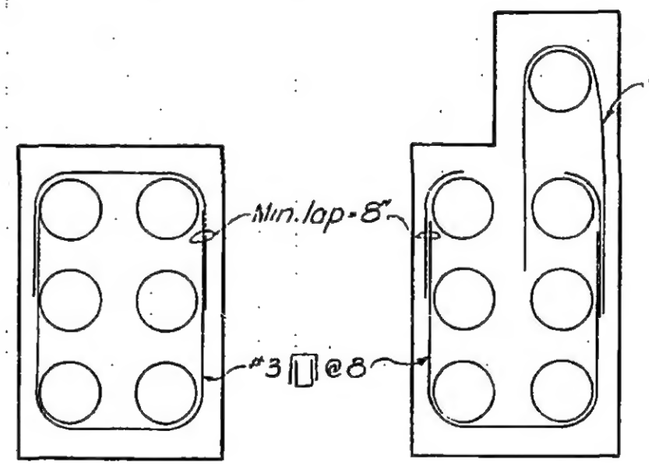
See Gibbs & Hills drawings for location & numbers of conduits, and dimension of conc. encasements



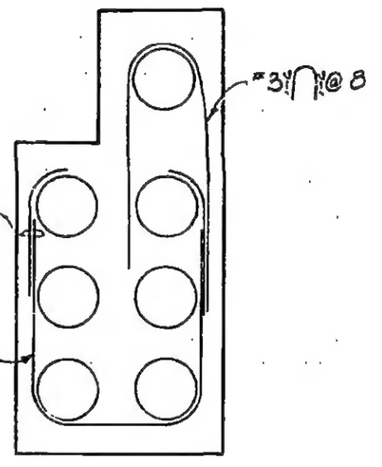
One Conduit



Two Conduit



More Than Two Conduits
(Detail similar for other arrangements of conduits)



TYPICAL REINFORCEMENT
(No Scale)

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DESIGNED

DRAWN D.C. Huggins

REVIEWED E.L.

8-JKG-5

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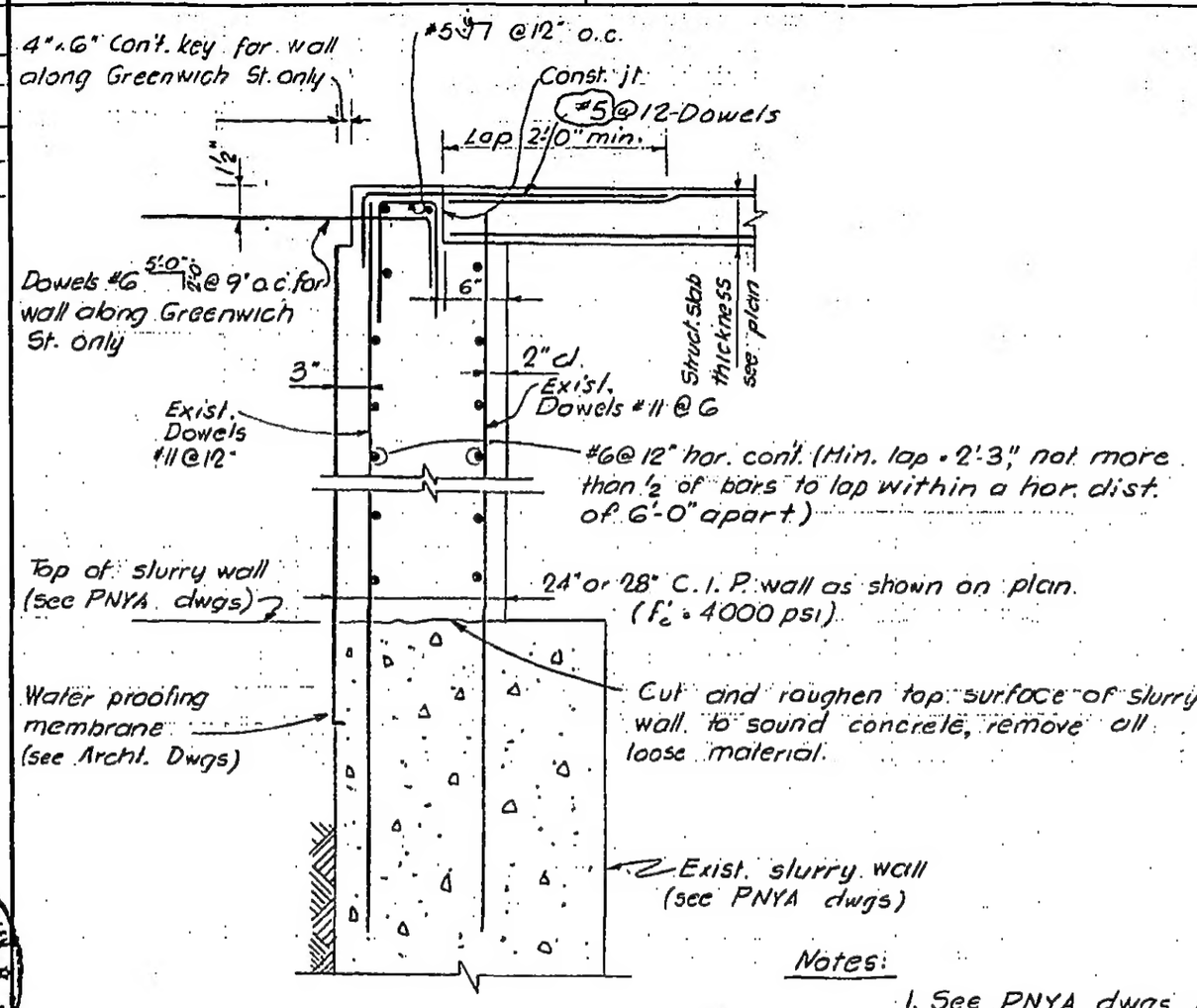
PROJECT THE WORLD TRADE CENTER | TITLE TYP. DET. OF C.I.P. WALL OVER TOP OF SLURRY WALL | DATE 5-1-68

REVISIONS
10-21-68
1-17-69
4-2-69
5-12-69



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Notes:

1. See PNYA dwgs. for top elevation of all #11 vert dowels from slurry wall. Where req'd, some of the dowels have to be burned-off so as to maintain 2" cl. from top of struct. slab.
2. See 8-JKG-7 for typ. detail of steel beam over C.I.P. perimeter wall.
3. See 8-JKG-8 for detail of temp. telephone conduit supports and pockets of these sup'ts.

DRAWN
S.C.

REVIEWED
J.M. & E.L.

8-JKG-6

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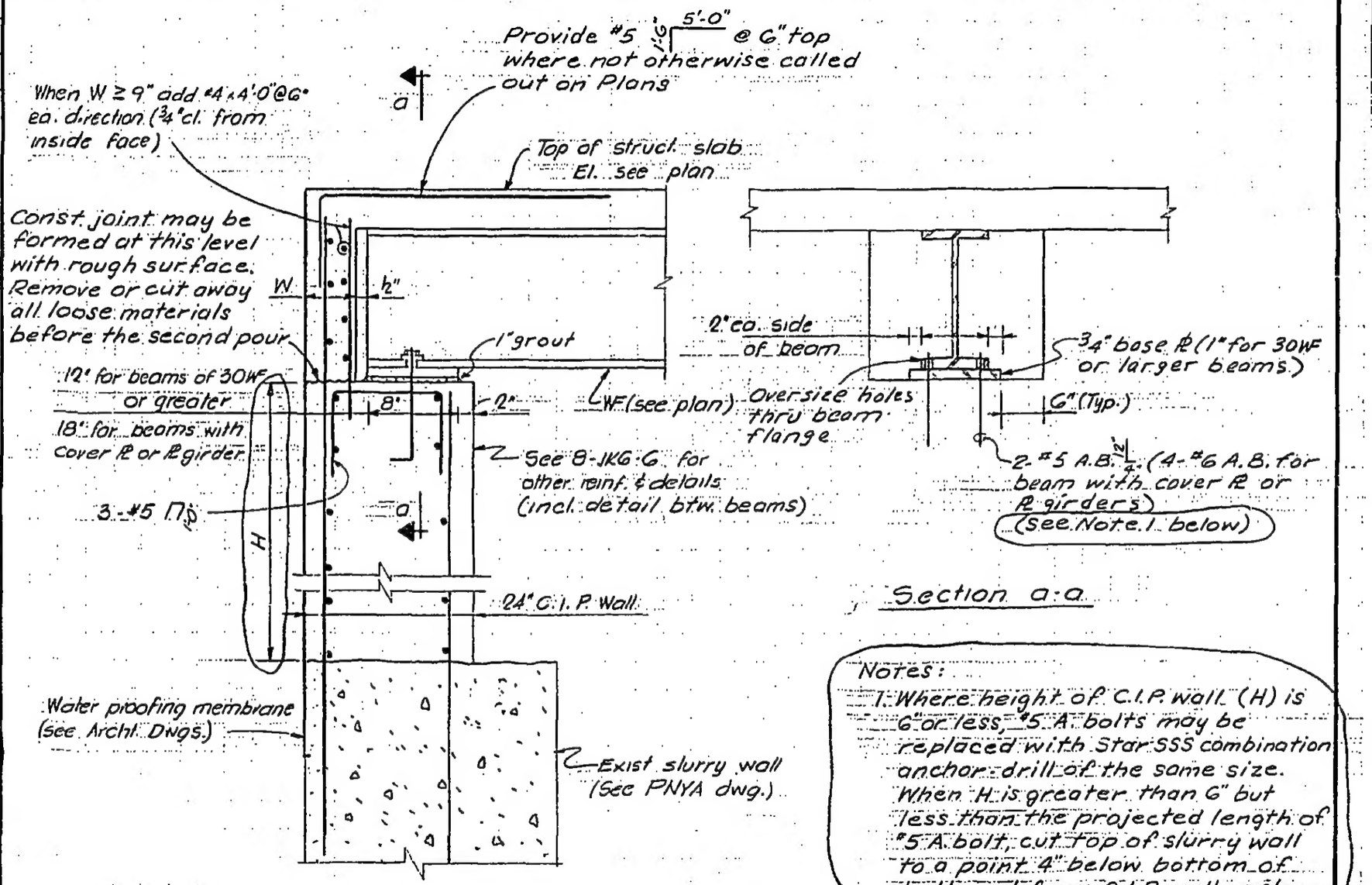
PROJECT THE WORLD TRADE CENTER | TITLE TYP. DET. OF STEEL BEAM OVER C.I.P. PERIMETER WALL | DATE 5-1-68

REVISIONS
7-9-68
1-24-69
3-25-69



Section a-a

Notes:
1. Where height of C.I.P. wall (H) is 6" or less, #5 A. bolts may be replaced with Star SSS combination anchor drill of the same size. When H is greater than 6" but less than the projected length of #5 A. bolt, cut top of slurry wall to a point 4" below bottom of bolt and form C.I.P. wall as shown.

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REVIEWED E.L.

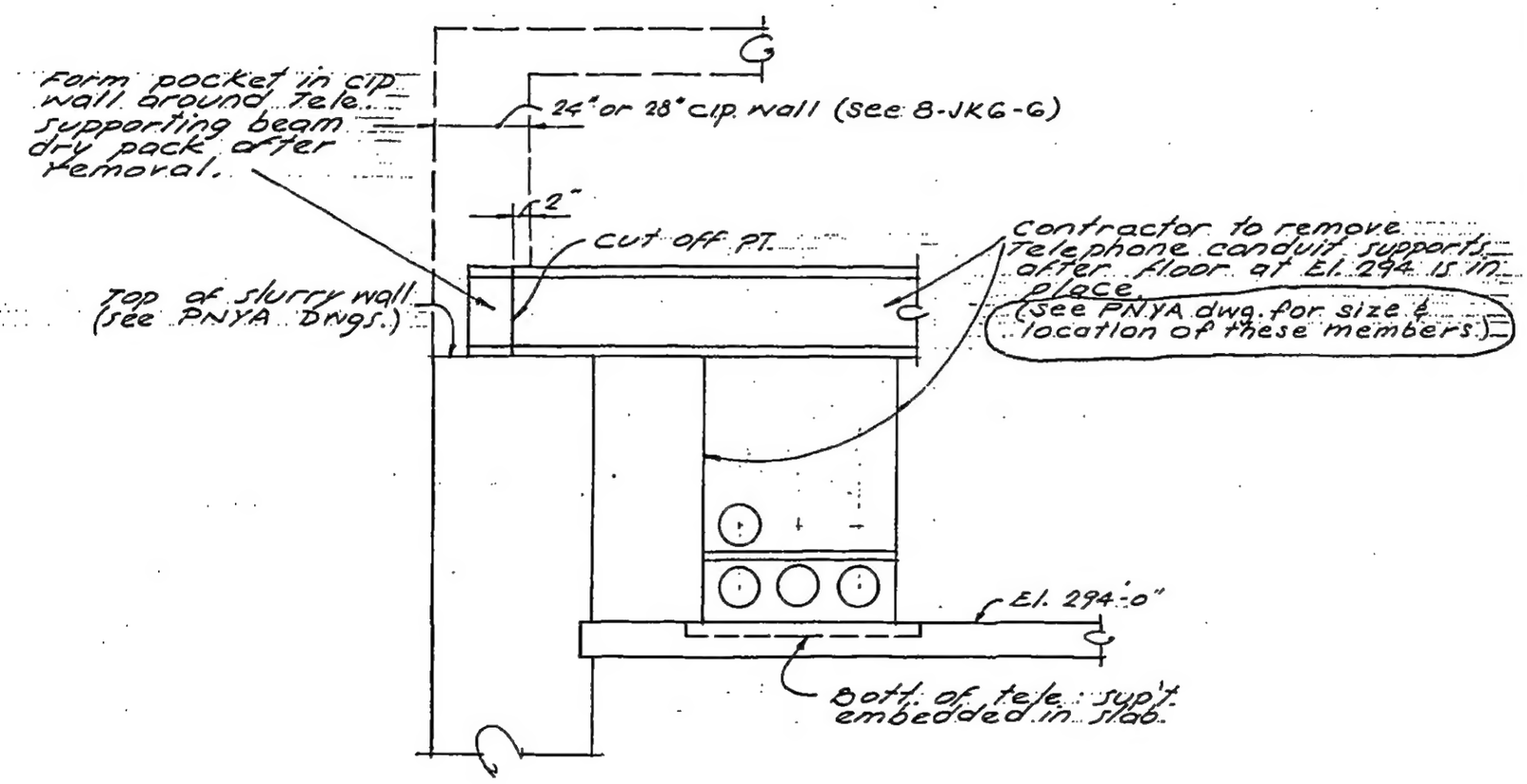
8-JKG-7

SKILLING - HELLE - CHRISTIANSEN - ROBERTSON Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER | TITLE TYPICAL DETAIL AT TOP OF SLURRY WALL ALONG WEST STREET | DATE 7-9-68

REVISIONS

10-21-68



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14

8-JK6-8

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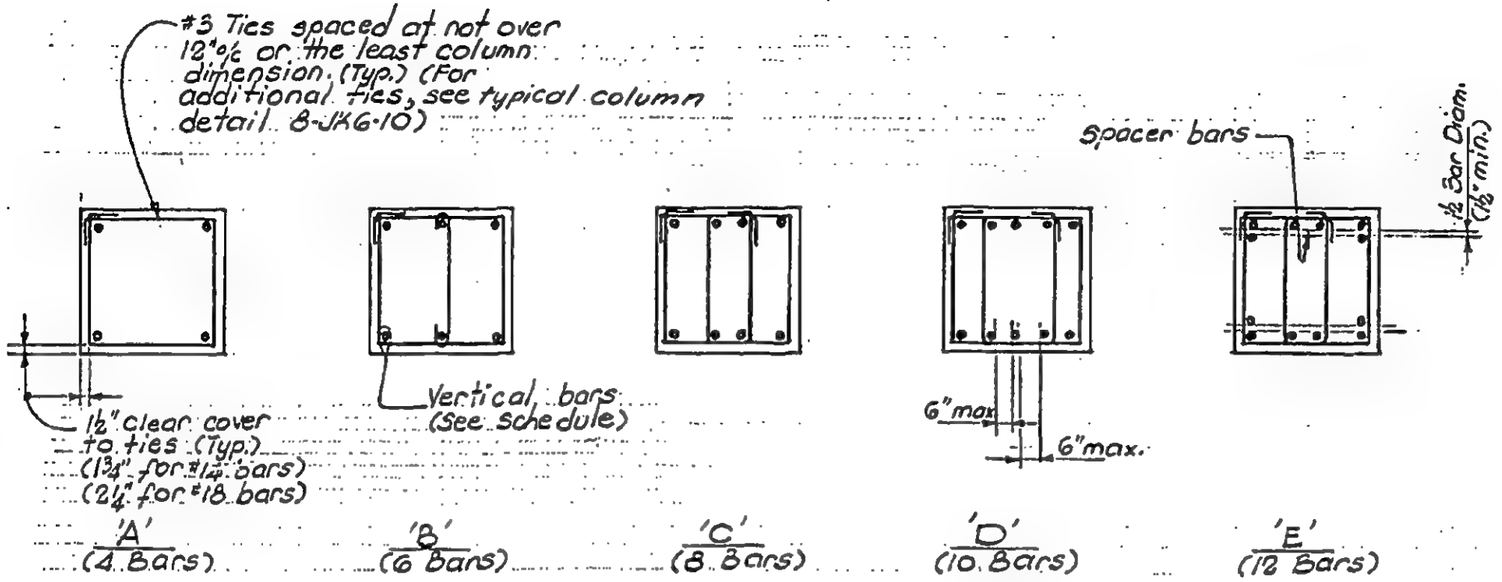
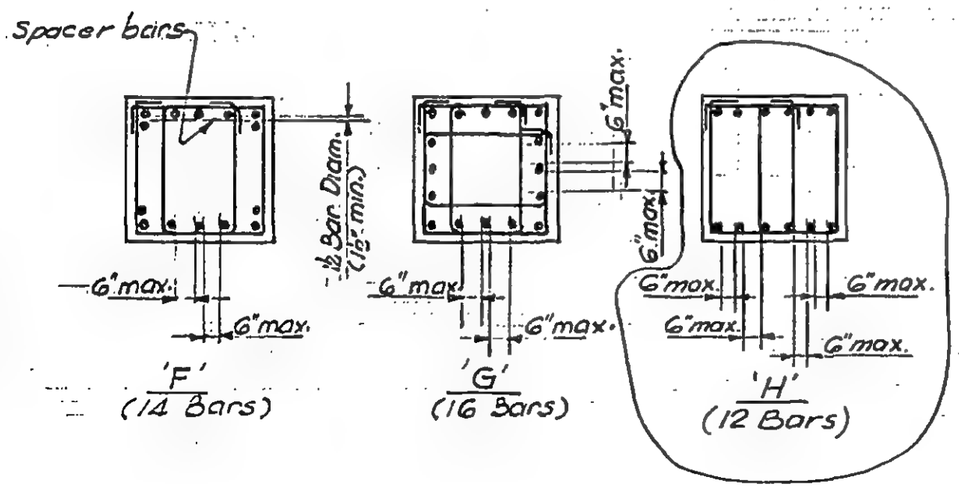
PROJECT THE WORLD TRADE CENTER | TITLE COLUMN TYPES | DATE 3-7-69

REVISIONS

11-4-69





NOTES:

1. All vertical bars to have Fy=60 ksi (ASTM A432-66)
2. All column ties to have Fy=40 ksi (ASTM A15-66)
3. Concrete strength for all columns to be f'_c=3000 psi except as noted.
4. See remarks in column schedule for orientation of reinforcement ("N"-stronger reinf. in N&S faces, "E"-stronger reinf. in E&W faces)

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10-16-68

DESIGNED

DRAWN STM

REVIEWED EL

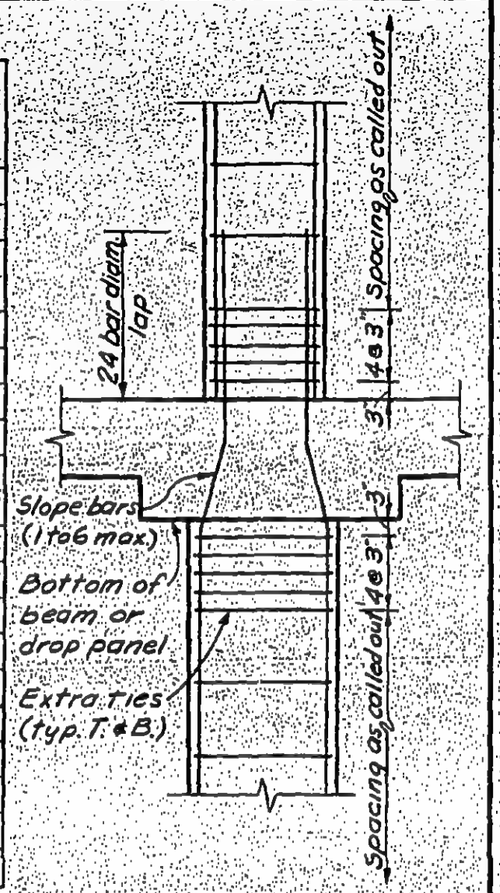
8-JK6-9

WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS
3-7-69
7-16-69

STORY / MK / ITEMS	J-80-1	J-80-2	J-80-3	J-81-1	J-81-2	J-81-3
El. 299'-0" — Size						
Vert. reinf.						
Loads (kips)						
Type						
Remarks						
El. 288.45' — Size	18x18	See Sect. B-B B-JK6-22	18x18	18x18	See Sect. B-B B-JK6-22	18x18
Vert. reinf.	4-#9	4-#9	4-#9	4-#9	4-#9	4-#9
Loads (kips)	52	156	80	65		68
Type	A	A	A	A	A	A
El. 267'-0" — Remarks						
Size			18x18	18x18	18x18	18x18
Vert. reinf.			4-#9	4-#9	4-#9	4-#9
Loads (kips)			280	164	192	160
Type			A	A	A	A
El. 253'-0" — Remarks						
Size						
Vert. reinf.						
Loads (kips)						
Type						
Remarks						



TYPICAL COLUMN DETAIL

NOTES:
1. See 8-JK6-9 for column type & other notes.

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12-16-68
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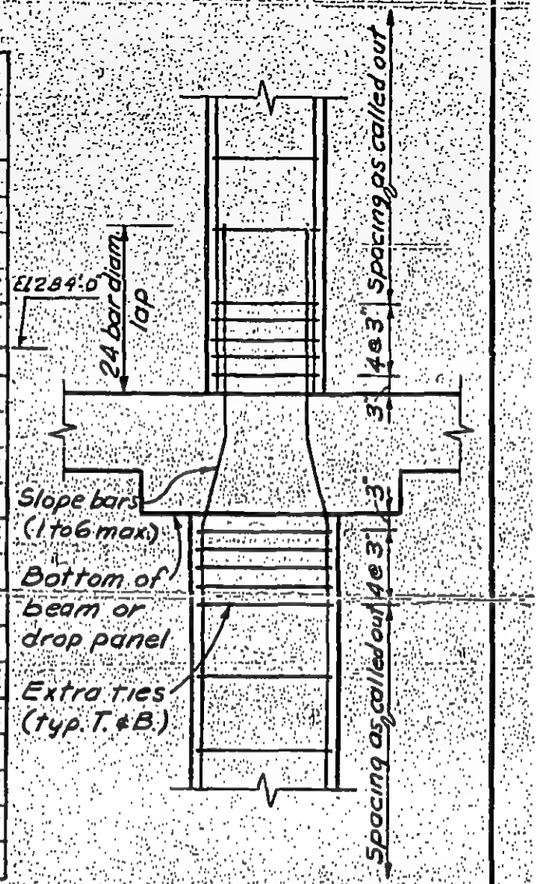
PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS
3-7-69
11-4-69

STORY / MK / ITEMS	J-82-1	J-82-2	J-82-3	J-82-4	J-83-1	J-83-2
El. 299'-0" — Size		18x18	18x18		18x18	18x18
Vert. reinf.		4-#9	4-#9		8-#10	8-#11
Loads (kips)		260	194		451	475
Type		A	A		C	C
Remarks					N	N
El. 288.45' — Size	18x18	See Sect. E-E 8-JK8-22	22x22 ■	18x18	See Sect. E-E 8-JK8-22	18x18
Vert. reinf.	4-#9	8-#10	12-#10	8-#9	16-#11	16-#11
Loads (kips)	47	340	882	-219	562	581
Type	A	C	H	C	G	G
El. 267'-0" — Remarks		N	N	N		
Size	18x18		18x18	18x18		18x18
Vert. reinf.	4-#9		8-#10	4-#9		16-#11
Loads (kips)	92		400	219		722
Type	A		C	A		G
El. 253'-0" — Remarks			N			
Size						
Vert. reinf.						
Loads (kips)						
Type						
Remarks						



TYPICAL COLUMN DETAIL

NOTES:
1. See 8-JK6-9 for column type & other notes.
2. ■ — f'_c = 4000 psi

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10-16-68
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A.F.

EL.

8-JK6-10.2

WORTHINGTON, SKILLING, HELLE & JACKSON Civil & Structural Engineers

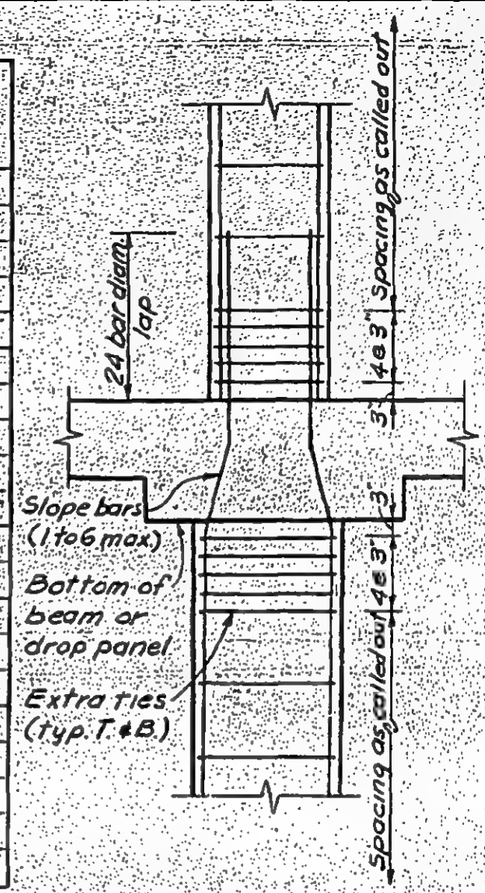
PROJECT THE WORLD TRADE CENTER | TITLE CONCRETE COLUMN SCHEDULE | DATE 7-9-68

REVISIONS

3-7-69

11-4-69

STORY El. 299'-0"	MK / ITEMS	J-83-3	J-84-1	J-84-2	J-84-3	J-84-4	J-84-5
	Size	18x18	18x18	18x18	18x18	18x18	
	Vert. reinf.	4-#9	6-#10	8-#11	12-#10	8-#9	
	Loads (kips)	186	361	484	537	350	
	Type	A	B	C	E	C	
El. 284'-0"	Remarks		N	N	N	N	
	Size	18x18	18x18	See Sect. H-H & JK8-22	18x18	18x18	See Sect. H-H & JK8-22
	Vert. reinf.	6-#10	12-#10	16-#11	16-#11	10-#10	4-#9
	Loads (kips)	315	474	617	679	430	
	Type	B	E	G	G	D	A
El. 267'-0"	Remarks	N	N			N	
	Size	18x18	18x18		20x20	18x18	18x18
	Vert. reinf.	10-#10	14-#11		16-#11	14-#10	4-#9
	Loads (kips)	427	620		822	548	150
	Type	D	E		G	F	A
El. 253'-0"	Remarks	N	N			N	
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						



TYPICAL COLUMN DETAIL

NOTES:

1. See 8-JK6-9 for column types & other notes.

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10-16-68 DRAWN A.F. REVIEWED

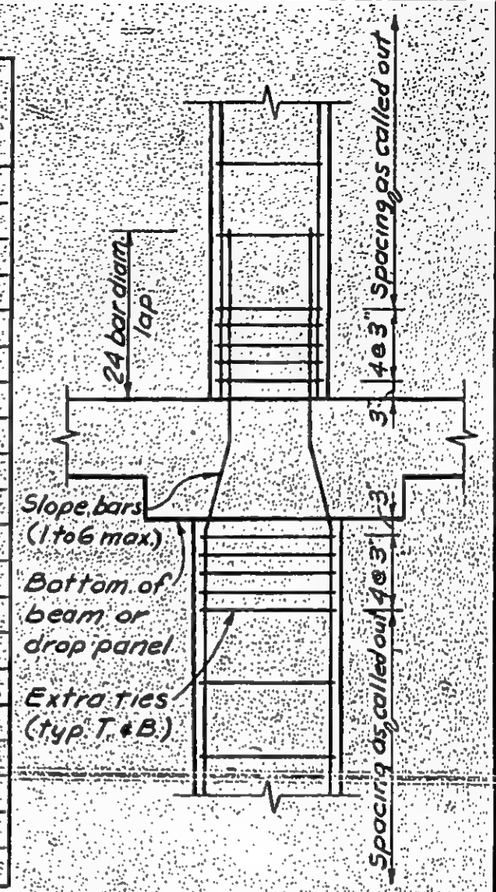
8-JK6-10.3

WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS
3-7-69
3-16-70
6-11-70

STORY	MK / ITEMS	J-85-1	J-85-2	J-85-3	J-85-4		
El. 299'-0"	Size	18×18	18×18	* 18×18	* 18×18		
	Vert. reinf.	4-#9	4-#9	4-#9	4-#9		
	Loads (kips)	52	52	70	79		
	Type	A	A	A	A		
El. 284'-0"	Remarks						
	Size	18×18	18×18	18×18	18×18		
	Vert. reinf.	4-#9	4-#9	4-#9	4-#9		
	Loads (kips)	65	65	134	130		
	Type	A	A	A	A		
El. 267'-0"	Remarks						
	Size		18×18				
	Vert. reinf.		4-#9				
	Loads (kips)		112				
	Type		A				
El. 253'-0"	Remarks						
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						



TYPICAL COLUMN DETAIL

NOTES:
1. See 8-JK6-9 for column types & other notes.
2. * — Top of column at El. 299'-0"

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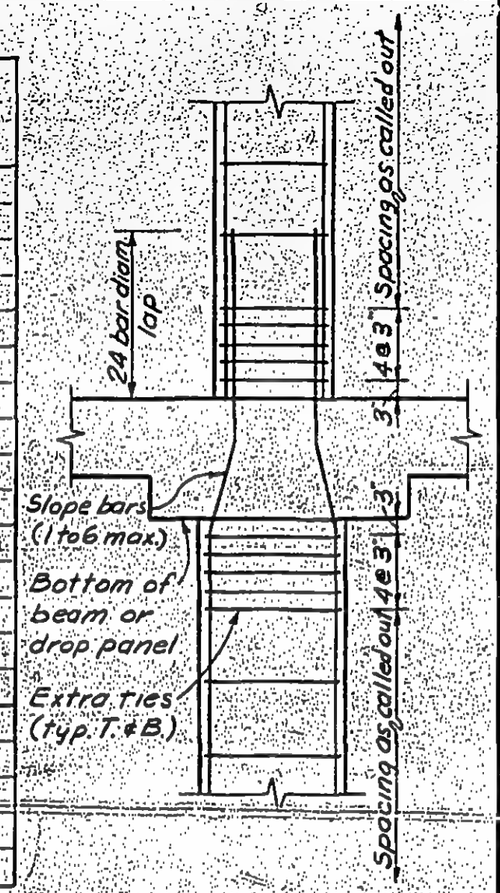
8-JK6-10.4

WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS
4-16-69
1-23-70

STORY	MK. / ITEMS	K-90-1	K-90-2			K-90-5	K-91-1
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
El 284'-0"	Remarks						
	Size						**18x18
	Vert. reinf.						6-#10
	Loads (kips)						343
	Type						B
El 270'-0	Remarks						N
	Size	20x20	20x20			20x20	18x18
	Vert. reinf.	*10-#11	*10-#11			*16-#11	14-#10
	Loads (kips)	556				693	470
	Type	D	D			G	F
	Remarks	N	N				N



TYPICAL COLUMN DETAIL

NOTES:
1. See 8-SK6-9 for column types & other notes.
2. * — Extend all bars into 27 wall above. Top of bars at El 273'.
3. ** — Top of column at El 284'.

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REVIEWED L.E.R.

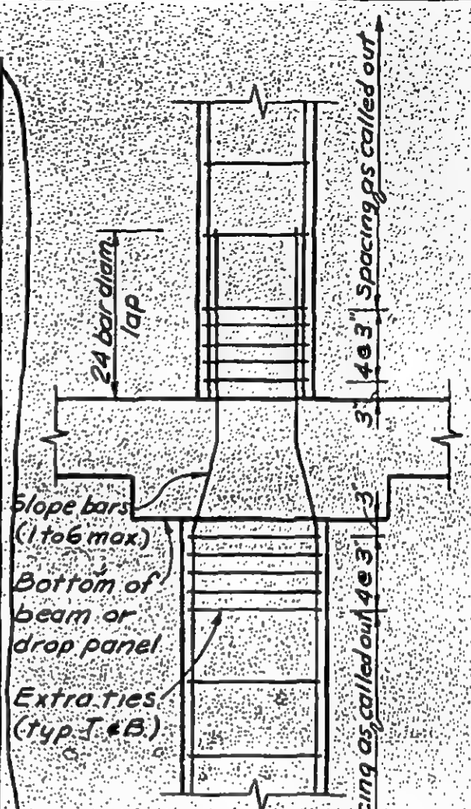
8-JK6-10.5

WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS
4-16-69

STORY	MK / ITEMS	K-91-2	K-91-3	K-91-4	K-91-5	K-91-6	
El. 300'-0"	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						
El. 284'-0"	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						
El. 270'-0"	Size	*18x18	▲18x18		▲18x18		
	Vert. reinf.	8-#11	8-#11		12-#11	1	
	Loads (kips)	405	414		558		
	Type	C	C		E		
	Remarks	N	N		N		
	Size	18x18	18x18	18x18	18x18	18x18	
	Vert. reinf.	14-#11	14-#10	14-#11	16-#11	4-#9	C
	Loads (kips)	529	462	515	558	106	
	Type	F	F	F	G	A	
	Remarks	N	N	N			



TYPICAL COLUMN DETAIL

NOTES:
1. See 8-JK6-9 for column type & other notes.
2. ** —— Top of column at El. 284'
3. ▲ —— Top of column at El. 290'

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8-JK6-10.6

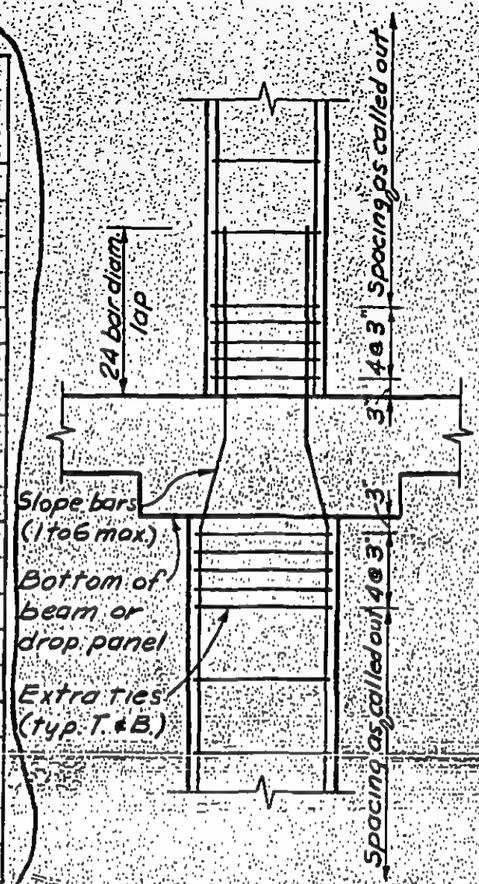
WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 7-9-68

REVISIONS

4-16-69 CF

STORY	MK / ITEMS	K-92-1	K-92-2				
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
El 300'-0"	Remarks						
	Size	18x18	18x18				
	Vert. reinf.	6-#10	6-#10				
	Loads (kips)	355	342				
	Type	B	B				
El 284'-0"	Remarks	N	N				
	Size	18x18	18x18				
	Vert. reinf.	8-#11	8-#11				
	Loads (kips)	460	434				
	Type	C	C				
El 270'-0"	Remarks	N	N				
	Size	18x18	18x18				
	Vert. reinf.	16-#11	14-#11				
	Loads (kips)	566	545				
	Type	G	F				
	Remarks		N				



TYPICAL COLUMN DETAIL

NOTES:

1. See 8-JKG-9 for column type & other notes.

LICENSED PROFESSIONAL ENGINEER — LESLIE E. ROBERTSON — NEW YORK

10-16-68

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REVIEWED E.L.

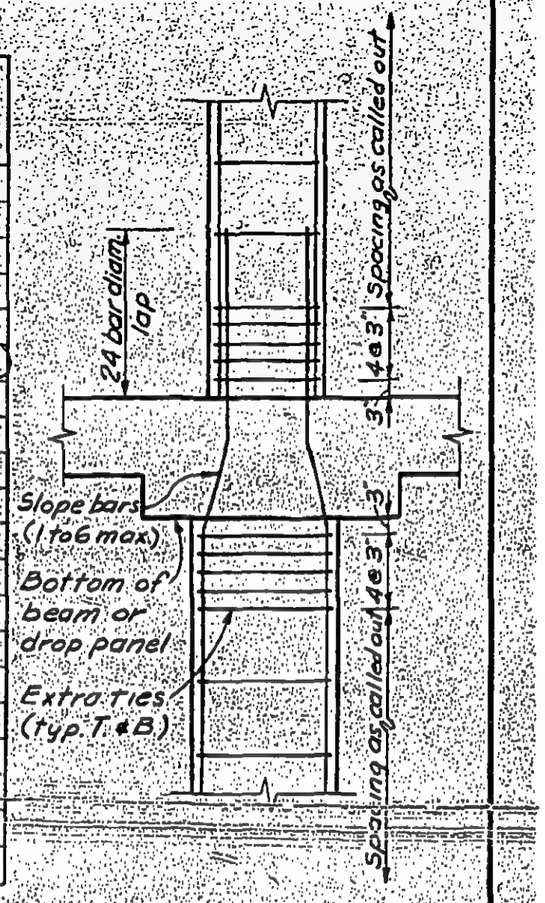
8-JKG-10.7

WORTHINGTON, SKILLING, HELLE & JACKSON — Civil & Structural Engineers

PROJECT: THE WORLD TRADE CENTER | TITLE: CONCRETE COLUMN SCHEDULE | DATE: 4-16-69

REVISIONS
1-23-70

STORY	MK / ITEMS	K-93-1	K-93-2	K-93-3	K-93-4	K-93-5	K-93-6
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
El. 294'-0"	Remarks						
	Size	20×20	20×20	20×20	20×20	20×20	20×20
	Vert. reinf.	4-#9	4-#9	4-#9	4-#9	4-#9	4-#9
	Loads (kips)	300	203	218	210	190	218
	Type	A	A	A	A	A	A
El. 284'-0"	Remarks						
	Size	20×23½	20×20	20×20	20×23½	20×23½	20×23½
	Vert. reinf.	6-#11	4-#9	4-#9	4-#9	4-#9	4-#9
	Loads (kips)	369	250	268	258	234	278
	Type	B	A	A	A	A	A
El. 274'-0"	Remarks	N					
	Size						
	Vert. reinf.						
	Loads (kips)						
	Type						
	Remarks						



TYPICAL COLUMN DETAIL

NOTES:

1. See 8-JKG-9 for colum type & other notes.
2. Size b×d indicates b in N-S direction
   d in E-W direction
3. Provide dowels from 27" wall below to match the reinf. in columns above El 274. Bottom of dowels at El 271.

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10-16-68

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S.C.

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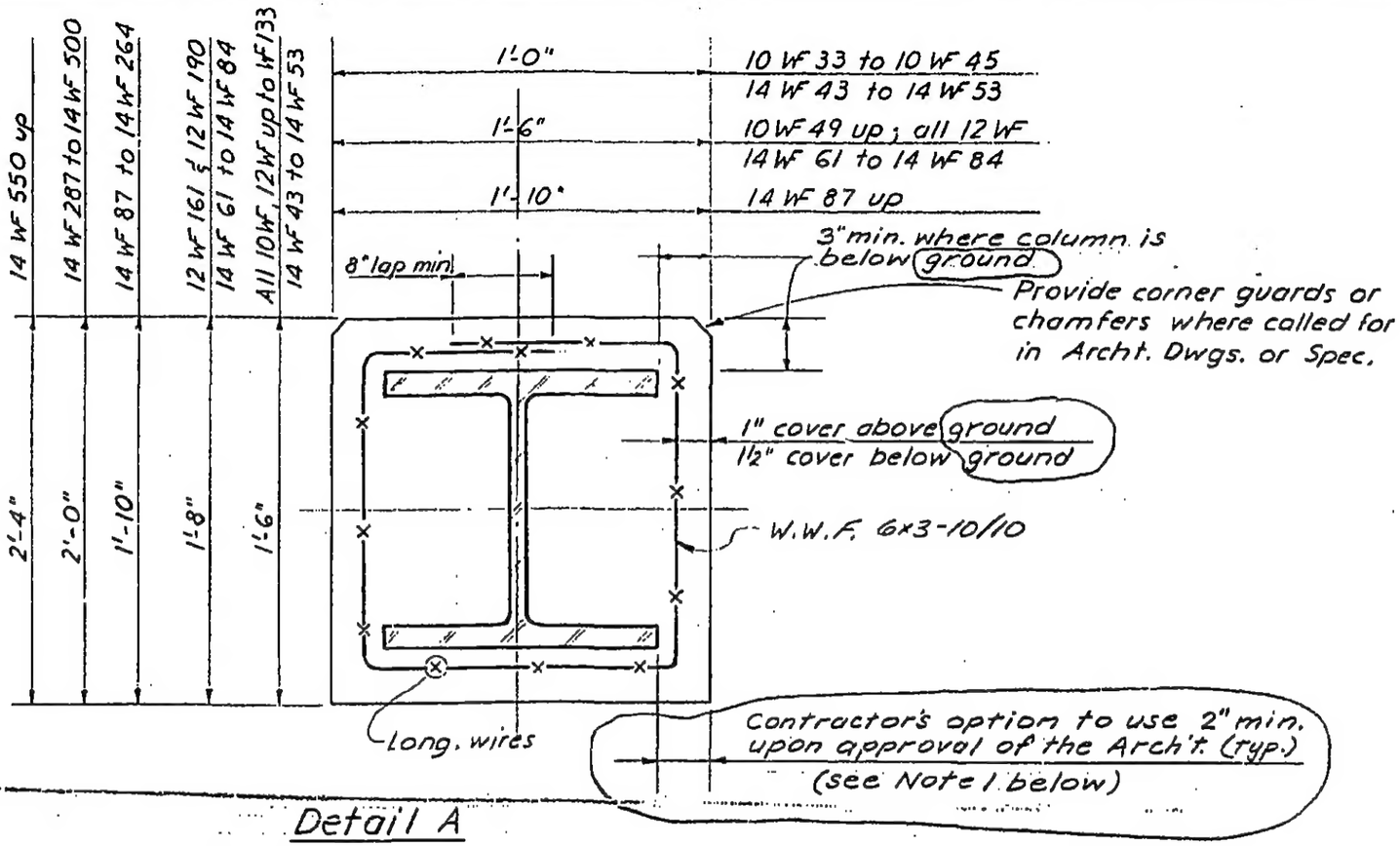
8-JKG-10.8

SKILLING - HELLE - CHRISTIANSEN - ROBERTSON Structural & Civil Engineers

PROJECT THE WORLD TRADE CENTER | TITLE CONCRETE ENCASEMENT OF STEEL COLUMNS | DATE 5-1-68

REVISIONS
10-21-68
4-9-69



Detail A
Concrete Encasement to Steel Column

(f'c = 2500 psi)

Note:

1. Dimensions do not apply where otherwise shown in Plans & Details or special sizes as shown on Arch't. Dwgs.
2. See 8-JKG-11.2 and 11.3 for Detail of conc. Walls at Steel Columns
3. Conc. encasement for steel cols. are req'd for all cols. below floor at El. 310, except otherwise noted

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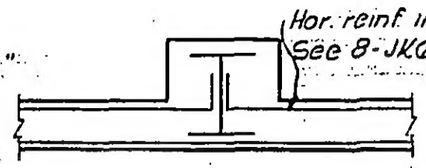
8-JK6-11.1

SKILLING - HELLE - CHRISTIANSEN - ROBERTSON Structural & Civil Engineers

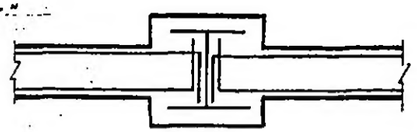
PROJECT THE WORLD TRADE CENTER | TITLE TYP. DETAIL OF CONC. WALL AT STEEL COLS. - DOUBLE CURTAIN | DATE 5-1-68

REVISIONS

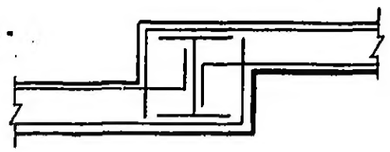
"A"



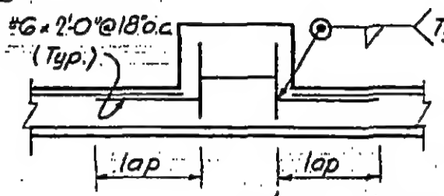
"F"



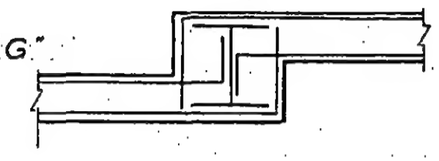
"K"



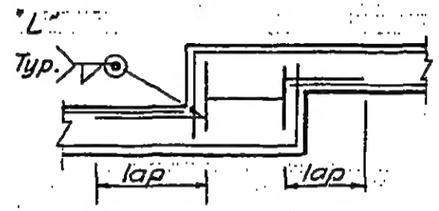
"B"



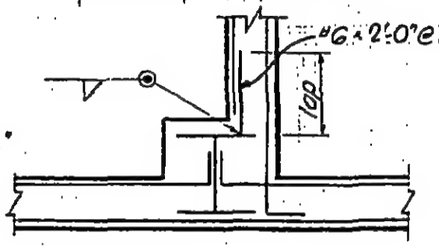
"G"



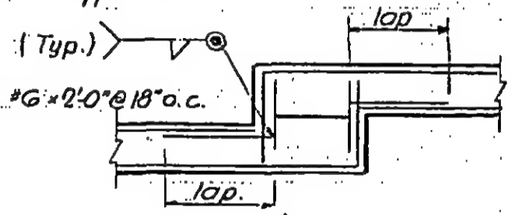
"L"



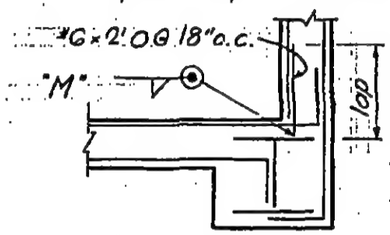
"C"



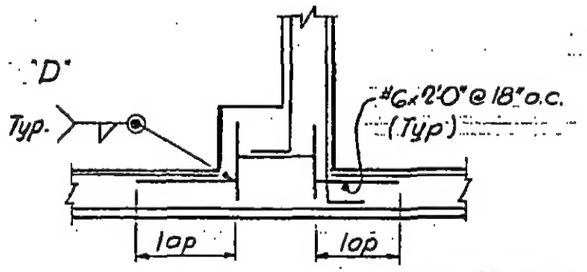
"H"



"M"



"D"



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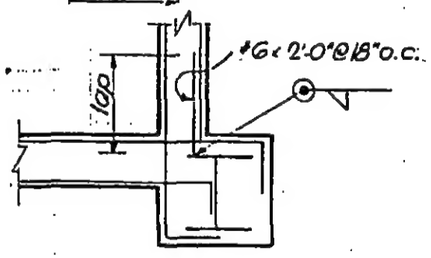

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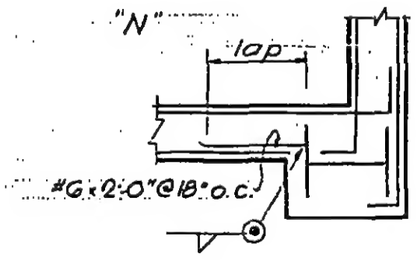

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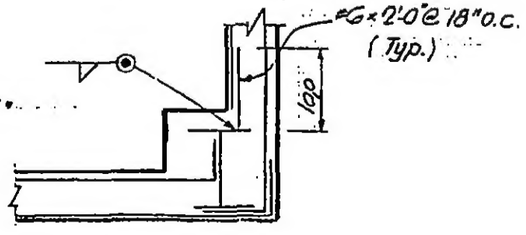

Notes:

1. WWF Reinf. around col. not shown, see Det. on 8-JKG-11.1
2. All welds to be ¼"
3. All lap shown to be 1'-10" min.
4. Wall Reinf. see 8-JKG-2.2
5. All hooks shown are 90° Std. hooks, except as shown
6. See 8-JKG-11.3 for walls with single curtain Reinf.

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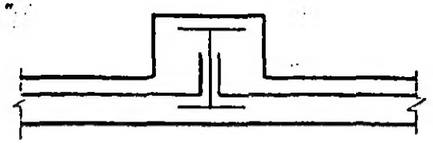
8-JKG-11.2

SKILLING - HELLE - CHRISTIANSEN - ROBERTSON Structural & Civil Engineers

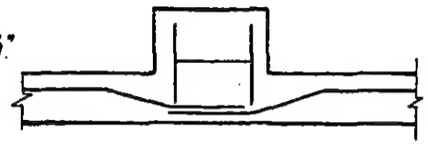
PROJECT THE WORLD TRADE CENTER | TITLE TYP. DETAIL OF CONC. WALL AT STEEL COL. - SINGLE CURTAIN | DATE 5-1-68

REVISIONS

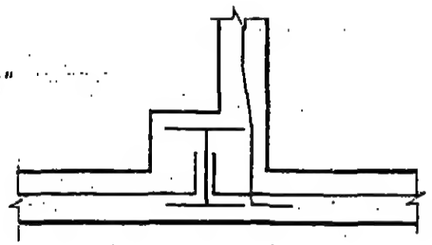
"A"



"B"



"C"



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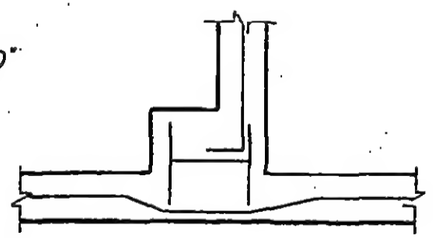

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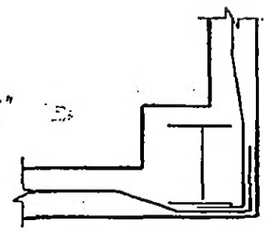

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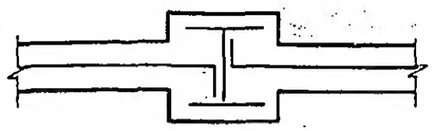

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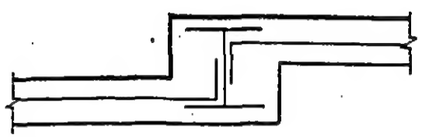
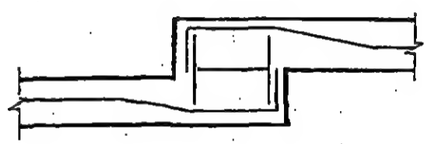
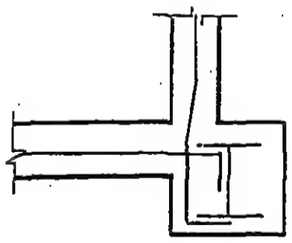


"H"



"J"



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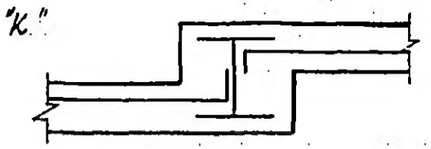

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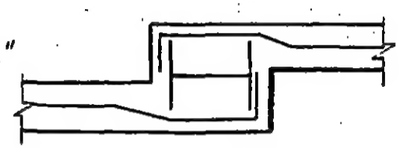

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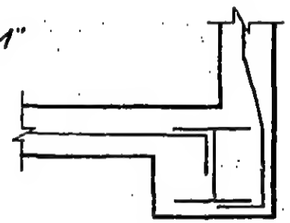

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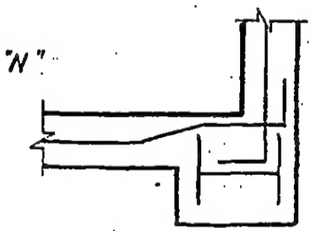

Notes:

1. WWF Reinf. around col. not shown, see Detail on 8-JKG-11.1
2. Wall reinf. see 8-JKG-2.2
3. All Hooks shown are 90° Std. Hooks except as shown.
4. See 8-JKG-11.2 for walls with double curtain reinf.

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8-JKG-11.3

21-1066-LERA